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AMIN. TUROCY & CALVIN, LLP
24TH FLOOR, NATIONAL CITY CENTER
1900 EAST NINTH STREET
CLEVELAND, OH 44114

| EXAMINER | |
|---|---|
| LEE, CHUN KUAN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2181 | |

| NOTIFICATION DATE | DELIVERY MODE |
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| 09/17/2007 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket1@thepatentattorneys.com
hholmes@thepatentattorneys.com
osteuball@thepatentattorneys.com

MN

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/777,368 | RITZ ET AL. | |
| | Examiner | Art Unit | |
| | Chun-Kuan (Mike) Lee | 2181 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5,7-17 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-17 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

## RESPONSE TO ARGUMENTS

1. Applicant's arguments filed 06/29/2007 have been fully considered but they are not persuasive. Objection to claim 13 is withdrawn. Currently, claims 6 and 18 are canceled, and claims 1-5, 7-17 and 19-22 are pending for examination.

2. In response to applicant's arguments, on pages 8-9, regarding the rejection of independent claim 1 rejected under 35 U.S.C. 103(a) that the combination of references does not teach/suggest the claimed limitations associated with a single field that allow (e.g. read, read and write, write) and disallow (e.g. no access) access information, because the combination of references only teaches a table utilized for allowing access, wherein the allow access comprises two separate fields; applicant's arguments have fully been considered, but are not found to be persuasive.

Please note that the features upon which applicant relies (i.e., allow and disallow of access) are not recited in the rejected independent claim 1. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The claimed limitation that the applicant's appears to be referring to is "... the access attribute field distinguish from amongst two or more of read, read and write, write and no access to indicate access ..." wherein the "amongst two or more" is selected from the following:

read (access allow),

read and write (access allow)

write (access allow), and

no access (access disallow),

therefore, it appears to the examiner that the field may include two or more of the access allow (e.g. read, read and write, write) or include one of access allow (e.g. read, read and write, write) and one access disallow (e.g. no access), and as the applicant pointed out in the remarks (on page 8), Kondratiev is relied on for the teaching of allow accesses. Additionally, Kondratiev does teach a single field (e.g. ACL 210 of Fig. 2), wherein the single field comprises the sub-fields of read access and write access.

As the applicant appears to be applying similar arguments as presented above for independent claim 1 towards the independent claims 14, 17 and 21-22, the examiner will also be applying the above response to the corresponding independent claims.

## I. INFORMATION CONCERNING OATH/DECLARATION

***Oath/Declaration***

3. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63.**

## II. INFORMATION CONCERNING DRAWINGS

***Drawings***

4. The applicant's drawings submitted are acceptable for examination purposes.

## III. REJECTIONS BASED ON PRIOR ART

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 7-17 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Safranek et al. (US Pub 2004/0193755) in view of Kondratiev et al. (US Patent 6,922,740).

6. As per claim 1,14, 17 and 21-22, Safranek teaches a direct memory access memory corruption detection system and method embodied in a computer readable medium comprising the following computable executable components:

receiving a request for a direct memory access transaction, the request comprising a least one memory address ([0014]-[0021]);

a memory controller (northbridge 117 of Fig. 1) that includes an access table (access data) that stores access information (access information stored in NoDMA table 103 and NoDMA cache 109 of Fig. 1) associated with memory (Fig. 1, ref. 101),

the memory controller employs the access information and the request to determine whether the requested direct memory access is permitted and rejects the requested direct memory access if it is not permitted ([0014]-[0016]); and

a data field comprising a corrected platform error event ([0034] and [0038]), the corrected platform error event being based, at least in part, upon a determination that a requested direct memory access is not permitted ([0034] and [0038]), the determination being based, at least in part, upon access information stored in an access table (NoDMA table cache in Fig. 3) and the requested direct memory access ([0011]-[0021]).

Safranek does not teach the direct memory access memory corruption detection system and method comprising:

wherein the request further comprising a source identifier and a transaction access attribute;

wherein the access information comprising at least one source identifier, at least one memory address and at least one access attribute, the at least one access attribute distinguished from among two of read, read and write, write, and no access to indicate a combination of source and memory range identified by the at least one source identifier and the at least one memory address; and

a device driver that programs a device for a direct memory access operation, and, provides the access information to the memory controller via a direct memory access application interface.

Kondratiev teaches a system and a method comprising:

an access control list (ACL) (Fig. 2, ref. 210) (i.e. access table), the access table comprising a device ID (i.e. source identifier field), and an access attribute having a read access with memory address range and an write access with memory address range, wherein the read and write access (e.g. two distinguished access) are directly correspond to the device ID, as the read and write access indicates if the corresponding device ID will be granted/denied access to corresponding memory range (Fig. 2 and col. 4, ll. 40-65);

wherein the device ID being associated with a device (I/O device 140-1 of Fig. 1 and device ID of Fig. 2); and

a bus master (i.e. device driver) that programs (program by invoking a function to request DMA access) the device for the direct memory access operation, and provides the access information to the memory controller via the direct memory access application interface (col. 4, ll. 6-26 and col. 6, ll. 43-53).

It would have been obvious to one of ordinary skill in this art, at the time of invention was made to include Kondratiev's device ID, read and write access attribute with memory address range and the bus master into Safranek's DMA memory corruption detection system. The resulting combination of the references further teaches the DMA memory corruption detection system comprising

the request further including the device ID and the read and write access attribute;

wherein the access information including the device ID and the access attribute having the read access with memory range and the write access with memory range,

therefore the access attributes have two distinguished accesses (e.g. read and write) that directly corresponds to the device ID, as the two distinguished access indicates if the corresponding device ID will be granted/denied access to the corresponding memory range (e.g. memory address); and

a bus master that invoking the function to request DMA access for the device for the direct memory access operation, and provides the access information to the memory controller via the direct memory access application interface.

Therefore, it would have been obvious to combine Kondratiev with Safranek for the benefit of increase security and reliability for accessing DMA (Kondratiev, col. 7, ll. 30-41).

7. As per claims 2-3, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Kondratiev further teaches the direct memory access memory corruption detection system comprising the access information comprising a direct memory access request, and wherein the direct memory access request comprising a transaction type (e.g. read-write access) (Kondratiev, Fig. 2 and col. 4, ll. 23-26).

8. As per claims 4-5, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Kondratiev further teaches the direct memory access memory corruption detection system comprising the direct memory access request comprising a source identifier (e.g. device ID), and wherein the source identifier being associated with

a device (I/O device 140-1 of Fig. 1 and device ID of Fig. 2) (Kondratiev, col. 4, ll. 40-65).

9. As per claim 7, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising wherein the access information comprising at least one permitted memory address (Safranek, [0014] and [0021]), wherein certain segments of the memory do not have access restriction, therefore request for access are allowed.

10. As per claim 8, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising wherein the access information comprising at least one disallowed memory address (Safranek, [0014] and [0021]), wherein certain segments of the memory have access restriction, therefore request for access are denied.

11. As per claim 9, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising wherein the request comprising a read action or a write action (Safranek, [0015]).

12. As per claim 10, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising wherein the request comprising a peripheral component interface express bus transaction (Safranek, [0017] and [0019]).

13. As per claim 11, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising wherein the memory controller coupled to a device through a peripheral component interface express bus, the device providing the request (Safranek, [0017] and [0019]).

14. As per claim 12, Safranek and Kondratiev teach all the limitation of claim 1 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising wherein the memory controller further providing error information, if the requested direct memory access is not permitted (Safranek, Fig. 4; [0034] and [0038]), wherein the error is logged and can be utilized for subsequent analyzing.

15. As per claim 13, Safranek and Kondratiev teach all the limitation of claim 12 as discussed above, where Safranek further teaches the direct memory access memory corruption detection system comprising the error information comprising source

information associated with the requested direct memory access (Safranek, Fig. 4; [0034] and [0038]).

16. As per claim 15, Safranek and Kondratiev teach all the limitations of claim 14 as discussed above, where Kondratiev further teaches the direct memory access memory corruption detection system further comprising the stored access information comprising a range of physical memory (access range), a source identifier (device ID), and an access attribute (read and write) (Kondratiev, Fig. 2).

17. As per claim 16, Safranek and Kondratiev teach all the limitations of claim 14 as discussed above, where Safranek teaches the direct memory access memory corruption detection system comprising wherein the request comprising a peripheral component interface express bus transaction (Safranek, [0017] and [0019]).

18. As per claim 19, Safranek and Kondratiev teach all the limitations of claim 17 as discussed above, where Kondratiev further teaches the method that facilitates detection of direct memory access memory corruption comprising storing access information in a access data store, the access information comprising a source identifier (device ID), at least one memory address (access range) and an access attribute (read and write) (Kondratiev, ACL 210 Fig. 2).

19. As per claim 20, Safranek and Kondratiev teach all the limitations of claim 17 as discussed above, where Safranek further teaches the method that facilitates detection of direct memory access memory corruption comprising a computer readable medium having stored thereon computer executable instructions for carrying out the method (Safranek, [0039]).

## IV. CLOSING COMMENTS

***Conclusion***

### a. STATUS OF CLAIMS IN THE APPLICATION

The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. 707.07(i)**:

#### a(1) CLAIMS REJECTED IN THE APPLICATION

Per the instant office action, claims 1-5, 7-17 and 19-22 have received a final action on the merits. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### b. DIRECTION OF FUTURE CORRESPONDENCES

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Kuan (Mike) Lee whose telephone number is (571) 272-0671. The examiner can normally be reached on 8AM to 5PM.

## IMPORTANT NOTE

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alford Kindred can be reached on (571) 272-4037. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

September 10, 2007

Chun-Kuan (Mike) Lee
Examiner
Art Unit 2181

ALFORD KINDRED
PRIMARY EXAMINER